

## **Mine Waste: A Social Deviance**

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### **ABSTRACT**

This study aimed to challenge the mission of the Mines and Geosciences Bureau that Mining Shall Be Pro-People and Pro-Environment in Sustaining Wealth Creation and Improved Quality of Life. To assess the Maricalum Mining Corporation (MMC) areas, including the tailing pan, open pit, drilling and blasting, watershed, residential, and mine foot. Utilized the qualitative research design using the direct observation, documentary analysis of the reports on the mining operation, particularly the "Geohazard assessment of areas located along the Calat-an River in Barangay Baclao, Cauayan and Barangay Cartagena, Sipalay City. The study revealed that the community needs to implement the cleanup activity to the abandoned mine waste to restore the ecological system of nature. Furthermore, the condition of the subject areas arrived in devising an appropriate removal and disposal plan for the destructive mining waste materials from the vast regions. The MGB utilized the fact-finding results as the basis for the action taken on dangerous mining wastes. The plan was submitted to the MGB-6 and in the national office for perusal and approval.

**KEYWORDS:** *Mine waste, Social deviance, Maricalum Mining Corporation (MMC), Department of Environment and Natural Resources (DENR), Mines and Geosciences Bureau (MGB)*

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### **INTRODUCTION**

Knowledge of mining has become a favorite topic for analysis in the present time to challenge the protection of the natural resources in the many parts of the Philippines.

The leadership of former Environment and Natural Resources Secretary Gina Lopez has led to the hope that the proper implementation of laws for environmental protection will flourish however, that hope had been aborted after she was been ousted from her position due to her strong-willed war against mining (GMA, 2017).

Gina Lopez ordered for the cancellation of mining contracts in watershed areas in protecting resources from extraction. She shut down 75 total mining contracts all over the Philippines. Of the 75, majority of the canceled mining contracts are from Mindanao with 37 mining firms, in Luzon and Visayas 27 and also 11 mineral production sharing agreements (GMA, 2017).

Negros Island Region is one of the many Islands that are also experiencing the ill effect of mining. Its starting point was due to the large quantity of metallic mineral wealth of found

in Sipalay and adjoining areas of Cauayan and Hinoba-an. Sipalay has proven reserves of gold, copper, silver, nickel, and molybdenum, the largest national reserve (78.30%) of this precious metal (PDG, 1995).

The effects of mining operation in Negros specifically in Sipalay City deliver a damaging effect to the community brought about by the Maricalum Mining Corporation (PIP, 2007). The mining and quarry operations have brought untold miseries both economically and environmentally in the lives of the people living in the areas where mining firms operate. Destruction resulted from mining deforestation, soil erosion, siltation, air pollution, damage to live stocks and crops, increased water turbidity and alteration of terrain among others (NGO File, 2005).

Several investigations were made by the Non-Governmental Organizations due to complaints of the residents of Sipalay and Cauayan. In July 2004, another complaint was acted into several environmental watchdogs when the existence of the biggest and major river system in Negros was threatened by

the largest quarry operation in the province, the Krush Rock Corporation.

Over the years, the operation of Maricalum Mining Corporation (MMC) resulted to numerous abandoned mine waste which resulted to environmental as well as human hazard due to the fact that large quantity of mine waste materials were left that destroyed the balance of the ecosystem. Thus, this study was made.

### Objectives

The study aimed at assessing the mining areas and the abandoned mine waste of Maricalum Mining Corporation (MMC) in Sipalay City.

Specifically, the objectives were to investigate the following:

1. Assessment of the areas of the MMC: Tailing Pan, Open Pit, Drilling and Blasting, Water Shed, Residential and the Mine Foot.
2. Determine the lived experiences among the employees of the MMC.
3. Based on the results, proposed implementtaion plan of mine waste cleanup.

### Theoretical Framework of the Study

The study is anchored on DENR MEMORANDUM ORDER NO. 99 - 32 Series of 1999 also known as "Policy Guidelines and Standards for Mine Wastes and Mill Tailings Management". These guidelines and standards shall govern all mine wastes and mill tailings management within the territory and exclusive economic zone of the Republic of the Philippines. According to its declaration policy *"It shall be the policy of the state that mine wastes and mill tailings produced by mining operators, permittees and contractors shall be managed in a technically, financially, socially, culturally and environmentally acceptable manner in a way that effectively safeguards the environment and protects the rights of concerned communities* (Cerilles, 1999).

Based on the reported documents from a non-government organization submitted report related to this study, there were river systems which were affected by mine waste and tailings and quarry operations. It was identified that Taongan River in Sipalay, Negros Occidental and the Sipalay River itself endure siltation and poisoning while, the Bago River experience siltation, poisoning and increased water turbidity (PDG, 1995).

In 2012, a private person requested the Mine Geosciences Bureau (MGB) 6 to conduct a site inspection and assessment of the areas affected by the scouring and erosion of the mining waste materials of Maricalum Mining Corporation (MMC). Since the said office ascertained the practicability of the request, on March 20, 2012 the MGB Senior Science Research Specialist together with the Geological Aide and two (2) representatives visited the affected areas. The particular locations that were checked include the mining waste, dumping site, headwaters and downstream portion of Calat-an river and the location of nearest communities. The findings and recommendations of this fact-finding activity were utilized as basis for the action taken by Mines and GeoSciences Bureau on matters concerning the negative impacts of the mining wastes.

Suerte (2014), highlighted on the geohazard assessment and field inspection the following: (i) that the head waters, portions of the hills and the areas adjacent to the river and the riverbed of the Calat-an River is covered with or affected by the scouring and erosion of the mining waste materials

from the mining operations of the MMC and the soil cover of the hills where these materials were dumped. (ii) Based on field observations, average thickness of the mining waste materials in the area was estimated to be 10 meters. Thus, approximate total volume of mining waste material of MMC on the private property is 2,608,530 cubic meter. (iii) The approximate thickness of the soil covered portion of the underlying rocks is more than 50 meters. If scouring and erosion continue in this area, more mining waste materials and soil cover may flow directly to the Calat-an River. (iv) The continuous supply of sediments to the Calat-an River makes it very shallow.

Further, the riverbed at the downstream portion of the river especially along the farmlands and the national highway is already of the same level as the surrounding farmlands and less than one-meter below some sections of the national highway. Water during rains will easily overflow and flood the surrounding farmlands and communities. In case of extreme weather events, a significant portion of mining waste materials and loose soil cover maybe dislodged into the community especially to the Calat-an river and rapidly flow downstream. This mass may cover more low-lying farmlands and sweep away houses and structures located along its path. (v) It is worth to note that there are numerous houses and structures in Barangay Cartagena located adjacent to the Calat-an River that are highly susceptible to flash foods and sheet floods. In addition, more low - lying farmlands and small hills adjacent to the Calat-an River maybe covered with sediments and will become unproductive if the siltation continues (Suerte, 2014).

The findings and conditions of the subject areas arrived to strong recommendation to devise an appropriate removal and disposal plan /proposal for these mining waste materials to be removed from the wide area. This should present a methodology, materials or equipment's, disposal sites to be used during the conduct of this activity and other relevant information. Moreover, it should take into consideration that the process of removal/disposal of mining waste materials will not cause any adverse effect in the vicinity of the subject areas and the disposal site. The plan must be submitted to the MGB-6 and or any other concerned government agency for reference/comments/approval before the conduct of any activity in the subject areas (Suerte, 2014).

In addition, a letter of information dated August 7, 2014 from Mr. Leo Van V. Juguan, CESO V, Regional Director of Mines and GeoSciences Bureau of the Department of Environment and Natural Resources was received by the VJGG Environmental and Development Network, Inc. Founder. In the letter, Regional Director Juguan mentioned that his office has determined that the mine waste from a private property must be removed. However, because of the large volume of materials involved, there is a need for a systematic plan for the removal of these materials. Hence, the VJGG Environmental and Development Network, Inc. is required to submit a proposed clean - up or removal plan considering the safety and the environmental aspects of the project. This requirement is in compliance to the memorandum of MGB Director Leo L. Jazareno dated July 2, 2014 duly received by MGB - 6 on July 30, 2014 related to the proposed clean - up of the area affected by mine waste of Maricalum Mining Corporation (MMC) in Sipalay City, Negros Occidental. This is to take effect the mission of the Mines and GeoSciences Bureau that *"Mining Shall Be Pro*

## *People and Pro-Environment in Sustaining Wealth Creation and Improved Quality of Life".*

In response to this necessity, the VJGG Environmental and Development Network, Inc. and the concerned individuals conducted sessions to determine the needed documents to be submitted and to meet the requirement on time. A team was then created to devise a proposed removal and disposal of mining waste materials of Maricalum mining Corporation (MMC) in Barangay Baclao Cauayan and Barangay Cartagena, in Sipalay City and areas adjacent to the Calat-an River, Province of Negros Occidental. Thus, mine waste management implementation plan was created based on the assessment and the interviews from the residents who at the same are the former workers in MMC.

### **Significance of the Study**

This study is valuable to the participants, the Department of Environment and Natural Resources (DENR) - Mines and Geosciences Bureau (MGB), the Non-Government Organizations, school administrators of criminology education, Philippine National Police (PNP), Local Government Units (LGUs), the general public, and present and future researchers.

### **MATERIALS AND METHODS**

This study employed the qualitative research design utilizing the direct observation, documentary analysis of the reports on mining operation particularly the "*Geohazard assessment of areas located along the Calat-an River in Barangay Baclao, Cauayan and Barangay Cartagena, Sipalay City allegedly affected by the scouring and erosion of mining waste materials of the Maricalum Mining Corporation*" and face-to-face/one-to-one interviews with the former workers of Maricalum Mining Corporation. According to Holmes (2013), in direct observation the researcher is a direct observer and doesn't typically try to become a participant in the context. The direct observer does strive to be as unobtrusive as possible so as not to bias the observations. It suggests a more detached perspective. The researcher is watching rather than taking part. It tends to be more focused since researcher is observing certain phenomenon or situations rather than trying to become immersed in the entire context.

On the otherhand, Triad3 (2016) explained that document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic. While Ryan et al. (2013) stated that one-to-one interview otherwise known as individual interview is a valuable method of gaining insight into people's perceptions, understandings and experiences of a given phenomenon and can contribute to in-depth data collection.

The verbal permission was availed from the individual participant since the officers from the City Hall rejected to be involved in the said fact-finding activity. The permission in utilizing a recorder and note-taking were approved by the participants of the study. The interview made was more than a conversational interaction between the researchers and the interviewees. The procedure required both knowledge and skill on behalf of the researchers to thematized verbal responses of the participants O'Leary, (2014). Since the process required a more accurate data than other data collection method, the questions were exactly worded, the question is read slowly, the use of correct intonation and emphasis were observed. Further, the researchers make sure

that each respond were understood, secured that each respond is adequate, seeing to it that the participant was not answered and lastly, all responses were recorded during the interview. The writing begun as soon as the participant begun talking. Erasure was not done in any form, if no answer is given to a question the word "refused" is written beside the follow up question and putting a note into the log-book. The procedure adhered to explain the purpose of the research to participants in the same manner. The researchers made an effort to ensure that each question is understood in the same way to the other participants. They try to extract correct information without bias while securing to be aware of the impact their behaviour to avoid over-familiarity.

The interview was unstructured. The process involved direct interaction between the researchers and the participant. The researcher had some initial guiding questions or core concepts being asked about the abandoned mine waste, there is no formal structured instrument or protocol. The researchers were free to move the conversation in any direction of interest that may come up. The responses were then encoded and transcribed to English language for Non-Hiligaynon speakers specifically to the DENR-MGB National Office to scrutinized the paper. A theme was extracted as to the lived experiences of the former workers at same time residents of Sipalay City to the abandoned mining wastes of MMC.

The participants of the study were four (4) Maricalum Mining Corporation employees who were residing in Barangay San Jose, Sipalay City. The interviewees were the local experts or workers of the said company for less than twenty-five (25) years who possessed the knowledge of the affected areas of MMC waste materials. The participants personally and voluntarily share their experiences to the abandoned mine waste materials since they still reside in the place. The information was taken voluntarily from the participants, meaning a consent from each of them were availed prior to the conduct of the interview.

The treatment of the data was determined by the following: For Objective 1 to assess the areas of the MMC: Tailing Pan, Open Pit, Drilling and Blasting, Water Shed, Residential and the Mine Foot, the direct observation method was made and the study on "*Geohazard assessment of areas located along the Calat-an River in Barangay Baclao, Cauayan and Barangay Cartagena, Sipalay City allegedly affected by the scouring and erosion of mining waste materials of the Maricalum Mining Corporation*" was analyzed. The data was subjected to thematic analysis.

According to Holmes (2013) direct observation is a method of collecting evaluative information in which the evaluator watches the subject in his or her usual environment or the phenomenon without altering that environment.

For Objective 2, to explore the lived experiences among the employees of the Maricalum Mining Corporation, the one-to-one interview or personal interview was used. The data was subjected to thematic analysis.

According to Woods (2010) one-to-one interview is used widely to supplement and extend the knowledge about individual(s) thoughts, feelings their knowledge about individual(s) thoughts, feelings and behaviors, meanings, interpretations, etc.

For Objective 3 to devise the implementation plan of mine waste clean up the recommendations on study on *"Geohazard assessment of areas located along the Calat-an River in Barangay Baclao, Cauayan and Barangay Cartagena, Sipalay City allegedly affected by the scouring and erosion of mining waste materials of the Maricalum Mining Corporation"* was analysed and used as guide in crafting the proposal.

According to Bowen (2009), document analysis is a social research method and is an important research tool in its own right, and is an invaluable part of most schemes of triangulation, the combination of methodologies in the study of the same phenomenon.

## RESULTS AND DISCUSSION

The objective 1 has assessed the areas of the Maricalum Mining Corporation specifically the Tailing Pan, Open Pit, Drilling and Blasting, Water Shed, Residential, Mine Foot. The following areas manifested the abandoned waste.

**Tailing Pan:** The abandoned and smashed up mining heavy equipments in Maricalum Mining Corporation mine shop were tangible and observable. Most of the equipment were working before mine's closure in 1995. Some of the equipment such as backhoe, Driller (Diamond Drill), Big Trucks, and the like remained under water while others were abandoned by the operators at the waste dump sites.

In addition, the Philippine Indigenous Peoples (2007) expounded that since the 'temporary' stoppage of operations of MMC in Sipalay City no fresh tailings have been discharged, causing tailings pond to dry up and become prone to wind actions. Due to this, highly excessive levels of dust effect area of 5 km; air quality affected; alleged increase in respiratory illnesses in nearby residents.

Further, pressure exerted by impounded tailings caused leak in decant tower of tailings pond at the Bulawan gold mine that cause siltation of Sipalay River Philippine Indigenous People (2007).

**Open Pit:** The dangerous open pit mine site (approximately 1.5km Deep and 1.9km wide) and the skeleton processing plant and offices of Maricalum Mining Corporation were existing. During its operations this pit was empty or water free. Before, was utilized and all of the heavy equipments and mining personnel were working freely.

Dam failure at tailings pond due to slippage of foundations on clayey soils at the Sipalay copper project leading to widespread inundation of agricultural land up to 1.5m high; siltation of the Tao-angan River (Philippine Indigenous People, 2007).

**Drilling and Blasting:** *Mine wastes and debris are observable in this area covered with stockpile of mining waste materials.*

Additionally, Mines and GeoSciences Bureau (MGB) classified the mountain slopes in the areas as highly to moderately susceptible to landslides and the areas adjacent to Calat-an River.

**Water Shed:** The Cartagena River was used by the residents situated in the upper portion Barangay Cartagena as regular path/way towards the Barangay proper and going back to their homes. Even light vehicle (Multicab owned by Cartagena Brgy. Council) was able to pass in this river because of the thick eroded waste and the moderate water available.

Suerte (2012) explained that the scouring and erosion of the mining waste materials of MMC and the soil cover of the hills provided a continuous supply of sediments to the Calat-an River and that makes it very shallow. In fact, the riverbed at the downstream portion of the river, especially along the farm lands and national highway. Water during rains will easily overflow and flood the surrounding farmlands and communities.

**Residential:** *Rice Farm is estimated of about 1meter difference to the surface level of Cartagena River. During rain fall the flood way of this river are the rice farm and the residential areas.*

In the study conducted by the Mines and Geoscience Bureau there are numerous houses and structures in Brgy. Cartagena, Sipalay City located adjacent to the Calat-an River that are highly susceptible to flashfloods and sheet floods. In addition, more lowlying farmlands and small hills adjacent to the Calat-an River maybe covered with sediments and will become unproductive if siltation continues.

**Mine Foot:** *According to MGB-6 who conducted the actual survey the estimated volume of the stock mine waste reaches the volume of around 2,608,530.*

Suerte (2012) stated that the thickness of the mining waste materials covering each lot varies since it follows the contours of the land. At the ridge and slope, the thickness varies from less than two meters to more than five meters and at the foot of the hills, it is inferred to more than ten meters since most of the scoured and eroded materials are deposited in the area.

According to Parbhakar (2016), acid water is also an undesirable Ecological Effects of Improper Mine discharge from the mines. Tailings disposal mill tailings provide a hostile environment to plants because they are deficient in important soil nutrients, all mining activities create an imbalance in the environment have excessive salts and heavy phytotoxic ants, and lackronment by altering landforms and physiography, microbial populations; moreover, physical damage is disrupting the hydrologic cycle, and discharging caused by unconsolidated sands that, when wind wastes into the rivers and polluting them with toxic blown, destroy young plants and seedlings. Mineral development activities such as the ex-tailings are also toxic and destructive to much aquaticcavations in open-pit mining, block-caving, ground life, because of the effects of heavy metals, reagents, preparation, including construction of roads and suspended solids.

"We have seen the devastating effects of some of the mining operations: the spillages of mine tailings in Boac, Marinduque, in Sipalay and Hinobaan, in Negros Occidental, in Itogon, Benguet, and mudflows in Sibutad, Zamboanga del Norte. The adverse social impact on the affected communities, especially on our indigenous brothers and sisters, far outweigh the gains promised by large-scale mining corporations. Our people living in the mountains and along the affected shorelines can no longer avail of the bounty of nature." Catholic Bishop of the Philippines (1998)

The objective 2 has explored the lived experiences among the employees of the Maricalum Mining Corporation. The four (4) participants interviews were thematic as follows:

**"Maricalum Mining Corporation run off huge mining wastes, health hazards, environmental destructions, agricultural soil infertility and low economic productivity".**

This phenomenon is in contradiction to the objectives of DENR MEMORANDUM ORDER NO. 99 - 32 (1999), which states that mine wastes and mill tailings must be effectively managed in an environmentally sustainable manner as well as with an environmentally acceptable health, safety, social and cultural concern. Also, according to its governing principles, management of mine wastes and mill tailings must be guided by current best practices committed to ensure control over its impacts and efficiently protect the environment; and mine wastes and mill tailings management shall be undertaken with due and equal emphasis on economic and environmental considerations, as well as safety, health, social and cultural concerns DENR M.O. NO. 99 - 32 (1999).

The above mentioned statement is also incongruent to the statement of the CORDILLERA PEOPLES ALLIANCE (2007) which elaborated that the combination of mines and dams had devastating impacts on the environment and on the indigenous people in the province. These impacts have not only caused serious environmental destruction and suffering for the affected communities, but have also violated the collective rights of the indigenous peoples. As proven by the experience of the Benguet indigenous peoples, large-scale corporate mining and dams destroy, pollute, disrupt agricultural economies, and displace indigenous peoples.

**"Mining is bad especially if the concerned party will just head off and leave unjustly therefore, parting the mine waste in the community which I assumed they have responsibility to it"**

According to Parbhakar (2016) that mining impacts can have lasting environmental and socio-economic consequences and be extremely difficult and costly to address through remedial measures. Wastes from the extractive industries have therefore to be properly managed in order to ensure in particular the long-term stability of disposal facilities and to prevent or minimize any water and soil pollution.

**"The nearby Barangays of Baclao, Cauayan, Brgy. San Jose and Cartagena in Sipalay City are tri-bounded by deep valley and far to each other decade ago. However, at present they are close to each other that we cannot afford to think that they are from two different municipality and city because of the eroded waste. Mining destroys the true nature of the nature".**

According to Cinco (2014), mining provide a hostile environment to plants because they are deficient in important soil nutrients. All mining activities create an imbalance in the environment.

This is also true to the statement of Nettleton et al. (2012) which stated that while companies express their commitment to high environmental standards and good relations with their host communities, the communities themselves tell of the repeated violation of environmental standards and their human rights. Locals fear for the future: they express openly their lack of confidence that either mining companies or the government will do enough to protect them from mining's worst effects.

***"i look forward to have someone to initiate to rehab our environment, help our community and aid assistance for the people in our place to avoid the furtherance of the damaging waste of mining thus, the future generation will not experience what we experience from mining today"***

According to Nettleton et al (2012), he expounded that the national governments, including that of the Philippines, continue to introduce legislation favoring big companies, to the detriment of ordinary people. This report calls for a more sustainable form of development instead, in line with the wishes of local communities. They also criticizes influential lenders, such as the World Bank, which promote policy reforms designed to expand the mining industry. The Extractive Industries Review (EIR), commissioned by the World Bank to assess its record in the sector and published in late 2003, agrees that mining projects, including many funded by the Bank, have too often entrenched rather than reduced poverty. Thus, the Bank has rejected its main recommendations.

Further, SPAN (2004) they stated that the benefits to the national economy remain so unclear, with negative effects appearing to be at least as likely as positive ones, it is vital to focus on the local impact of mining. Here the picture is clear - people who live near mines in the Philippines are overwhelmingly being made worse off, because of environmental degradation, economic stagnation and human rights concerns.

### **Implication**

This study implies that the implementation of the cleanup activity to the abandoned mine waste is needed by the community to restore the ecological system of the nature. The plan has envisioned to be successful and beneficial to the community. People have already suffered and will continue to suffer enormous damage to their lands and environment due to the long-term impacts of mine wastes Adraneda (2003). The reparation should be provided to the private properties affected by the mine waste with adequate monetary compensation, alternative means to develop the land, and the lastly, allowing them to develop the land. A program for the restoration and rehabilitation of lands and waters destroyed by mine waste should also be implemented Briones (2017). The law for the protection of the environment and human rights that are binding on all countries and companies, based on the highest existing standards, and with effective monitoring and sanctions must be imposed on the offending parties Coumans (2000). The laws should be made binding rather than voluntary and must be adopted as a minimum standard by the financial institutions and national governments when implementing development projects affecting the environment and its peoples. Maricalum Mining Corporation had inflicted damage in community of Sipalay and Cauayan, thus, should impose some form of penalty on the offending parties.

### **Conclusion**

The study concluded that the potential environmental and social impacts of the abandoned mining waste range from constricted, site-specific destruction to large-scale, particularly the indirect ecosystem degradation. Although mines waste may appear to be existing for a long time and had never been touched by MMC however, the long term effect of its existence is leading to the more land-extensive devastation, thus, the environmental and social impacts of

MMC mine waste extended well beyond the mine site because private lots were also affected including the farmlands, residential and other structures, and the watershed.

## Recommendations

The devised appropriate removal and disposal plan for the destructive mining waste materials from the wide areas of mining site must be implemented by the DENR-MGB.

Strict implementation of the national legislation and policy on the liberalization of mining industry must be observed. The need to review and revise existing laws as these have been proven detrimental to the eco-system with its light penalties provided. Lastly, the replication of this study to confirm the present results and to include other variables.

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